WHAT IS CLAIMED IS:

1. A chimeric retrovirus envelope protein comprising an ecotropic envelope protein and a heterologous short peptide ligand inserted within the ecotropic envelope protein.

2. The chimeric envelope protein of claim 1, wherein the ecotropic envelope protein is a Murine Leukemia Virus (MLV) envelope protein.

3. The chimeric envelope protein of claim 1, wherein the ecotropic envelope protein is a wild type envelope protein.

4. The chimeric envelope protein of claim 1, wherein the heterologous short peptide ligand is selected from the group consisting of an RGD ligand, a human epidermal growth factor receptor (HRG) ligand, or a gastrin releasing protein (GRP) ligand.

5. The chimeric envelope protein of claim 1, wherein the heterologous short peptide ligand is flanked by at least one cysteine on each side.

6. The chimeric envelope protein of claim 1, wherein the heterologous short peptide ligand is inserted into a conserved region of a wild-type envelope protein.

7. A nucleic acid molecule comprising a nucleic acid sequence encoding the recombinant chimeric envelope protein of claim 1.

8. A vector comprising a nucleic acid sequence encoding a chimeric envelope protein that contains a heterologous short peptide ligand.

9. The vector of claim 8, wherein the vector further comprises a nucleic acid sequence that encodes a therapeutically useful polypeptide.

10. A recombinant retroviral particle comprising a chimeric envelope protein comprising a heterologous short peptide ligand.

11. The recombinant retroviral particle of claim 10, wherein the retroviral particle can infect a mouse cell.

12. The recombinant retroviral particle of claim 10, wherein the retroviral particle cannot infect a mouse cell.

13. A method of altering retroviral tropism, the method comprising

(a) introducing into the genome of a retrovirus a nucleic acid sequence that encodes a chimeric envelope protein, and wherein

(b) the nucleic acid sequence of the chimeric envelope protein comprises a heterologous short peptide ligand, thereby producing a pseudovirus having altered tropism.

14. The method of claim 13, wherein murine leukemia virus (MLV) retroviral tropism is altered.

15. The method of claim 13, wherein the pseudovirus does not express wild-type envelope protein.

16. The method of claim 14, wherein the heterologous short peptide ligand is inserted into a conserved region of a wild-type envelope protein.

17. A method of identifying a nucleic acid sequence encoding a chimeric envelope protein that alters viral tropism, the method comprising

(a) introducing into the genome of a retrovirus, a nucleic acid sequence encoding a recombinant envelope protein comprising a heterologous short peptide ligand to produce a recombinant virus;

(b) infecting a target host cell with the virus; and

(c) assaying transduction of the target host cell by the virus, such that transduction of the host cell by the virus indicates that the nucleic acid sequence encodes a chimeric envelope protein that alters viral tropism.

18. The method of claim 17, wherein the virus is an MLV.

19. The method of claim 17, wherein the heterologous short peptide ligand is in a conserved region of the MLV envelope protein.

20. The method of claim 17, wherein the target host cell is a human cell.

21. The method of claim 17, wherein the target host cell is a cancer cell.

22. The method of claim 17, wherein the target host cell comprises a mutant gene and the retrovirus comprises a wild type nucleic acid sequence corresponding to the mutant gene.

23. The method of claim 17, wherein the chimeric envelope protein contains an RGD ligand, an HRG ligand, or a GRP ligand.

24. A method of delivering a nucleic acid sequence to a cell, the method comprising,

(a) providing a cell; and

(b) infecting a cell with a virus comprising a chimeric envelope protein and the nucleic acid sequence, wherein the chimeric envelope protein comprises a heterologous short peptide ligand.

25. The method of claim 24, wherein the heterologous short peptide ligand is an RGD ligand, an HRG ligand, or a GRP ligand.

26. The method of claim 24, wherein the cell is a mammalian cell.

27. The method of claim 24, wherein the cell is a human cell.

28. The method of claim 24, wherein the cell is a cancer cell.

29. The method of claim 24, wherein the cell is in an animal.

30. A method of treating cancer, the method comprising

(a) providing a cancer cell; and

(b) infecting a cancer cell with a virus, the virus comprising a chimeric envelope protein comprising a heterologous short peptide ligand and a therapeutically useful gene.

31. The method of claim 30, wherein the virus is a retrovirus.

32. The method of claim 30, wherein the cancer is in a mammal.

33. The method of claim 30, wherein the cancer is in a human.

34. The method of claim 30, wherein the therapeutically useful gene is encodes thymidine kinase.